



RURAL
CANCER
CONTROL
RESEARCH

Accelerating Rural Cancer Control Research

Presentation to the NCI Council of Research Advocates

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Background

- 14-19% of the US population lives in non-metropolitan (rural) counties
- Notable challenges, compared to urban areas:
 - Lower educational attainment
 - Higher proportion of elderly individuals
 - Higher poverty
 - Lower access to health services
 - Higher rates of behavioral risk factors (tobacco use, obesity)
- Only 3% of NCI DCCPS grants focus on rural populations



Making the Case for Investment in Rural Cancer Control: An Analysis of Rural Cancer Incidence, Mortality, and Funding Trends

Kelly D. Blake, Jennifer L. Moss, Anna Gaysynsky, Shobha Srinivasan, and Robert T. Croyle

Abstract

Estimates of those living in rural counties vary from 46.2 to 59 million, or 14% to 19% of the U.S. population. Rural communities face disadvantages compared with urban areas, including higher poverty, lower educational attainment, and lack of access to health services. We aimed to demonstrate rural-urban disparities in cancer and to examine NCI-funded cancer control grants focused on rural populations. Estimates of 5-year cancer incidence and mortality from 2009 to 2013 were generated for counties at each level of the rural-urban continuum and for metropolitan versus nonmetropolitan counties, for all cancers combined and several individual cancer types. We also examined the number and foci of rural cancer control grants funded by NCI from 2011 to

2016. Cancer incidence was 447 cases per 100,000 in metropolitan counties and 460 per 100,000 in nonmetropolitan counties ($P < 0.001$). Cancer mortality rates were 166 per 100,000 in metropolitan counties and 182 per 100,000 in nonmetropolitan counties ($P < 0.001$). Higher incidence and mortality in rural areas were observed for cervical, colorectal, kidney, lung, melanoma, and oropharyngeal cancers. There were 48 R- and 3 P-mechanism rural-focused grants funded from 2011 to 2016 (3% of 1,655). Further investment is needed to disentangle the effects of individual-level SES and area-level factors to understand observed effects of rurality on cancer.

Cancer Epidemiol Biomarkers Prev; 1-6. ©2017 AACR.

Introduction

Estimates of the total population living in nonmetropolitan (rural) counties in the United States vary from 46.2 (1) to 59 million (2) people, compared with more than 250 million people living in urban areas. This represents 14% to 19% of the U.S. population (1, 2). Rural communities face notable disadvantages compared with urban areas, including higher poverty rates, lower educational attainment, a higher proportion of elderly individuals, lack of access to health services, and a lack of resources needed to support the public health infrastructure (3). As a result of these and other factors, rural communities face elevated rates of morbidity and mortality, as well as greater percentages of potentially excess deaths from the five leading causes of death, including cancer (4). Individuals in rural counties not only have an 8% higher overall cancer mortality than those in urban areas, but a rural-urban disparity in mortality has also been observed for lung, colorectal, prostate, and cervical cancers, although, in several cases, adjusting for socioeconomic status attenuates or completely explains the relationship between rurality and higher cancer mortality (5).

Additional rural-urban disparities across the cancer control continuum have been documented, although the existing lit-

erature is nascent and methodologically inconsistent compared with other research identifying race-, economic-, and age-based disparities in diagnosis, treatment, and survival of cancer (6). At least two studies have demonstrated that cervical cancer incidence is higher in rural areas (7, 8). There is also some evidence that rural residents are less likely to get screened for cancer (6): for example, an analysis of 2008 Behavioral Risk Factor Surveillance System data showed that rural women were less likely to meet recommendations for mammography than urban women, that the proportion of women reporting appropriate cervical cancer screening decreased as rurality increased, and that individuals from rural areas were less likely to report colorectal cancer screening than individuals from urban areas (9). Furthermore, rural individuals may be less likely to receive follow-up testing after receiving abnormal screening results (10), and although findings are not consistent with regard to rural-urban differences in stage at diagnosis, some research suggests that women from rural areas are more likely to be diagnosed with more advanced breast cancer compared with their urban counterparts (11).

Evidence also suggests that there are rural-urban differences in cancer treatment. For example, rural women are more likely to receive mastectomies than breast-conserving surgery, and rural patients with either endometrial cancer or prostate cancer are less

Morbidity and Mortality Weekly Report (*MMWR*)[CDC](#) > [MMWR](#)

Invasive Cancer Incidence, 2004–2013, and Deaths, 2006–2015, in Nonmetropolitan and Metropolitan Counties – United States

Surveillance Summaries / July 7, 2017 / 66(14);1–13

S. Jane Henley, MSPH¹; Robert N. Anderson, PhD²; Cheryll C. Thomas, MSPH¹; Greta M. Massetti, PhD¹; Brandy Peaker, MD¹; Lisa C. Richardson, MD¹ ([View author affiliations](#))

View [suggested citation](#) and [related materials](#)

Abstract

Problem/Condition: Previous reports have shown that persons living in nonmetropolitan (rural or urban) areas in the United States have higher death rates from all cancers combined than persons living in metropolitan areas. Disparities might vary by cancer type and between occurrence and death from the disease. This report provides a comprehensive assessment of cancer incidence and deaths by cancer type in nonmetropolitan and metropolitan counties.

Reporting Period: 2004–2015.

Format: ▾

Article Metrics

Altmetric:



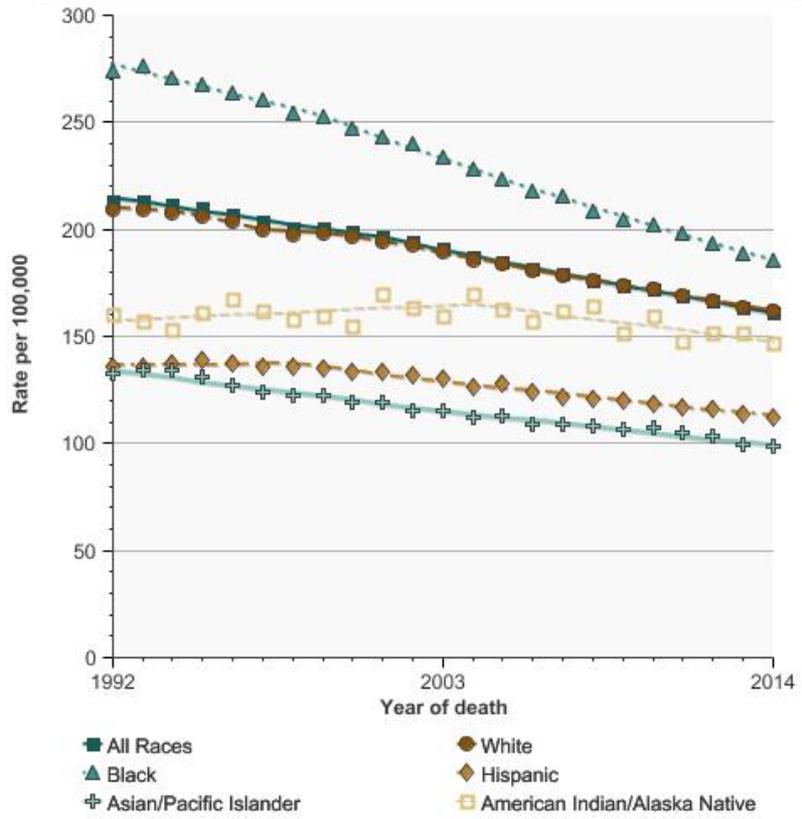
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Citations: 3

Views: 7,449

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U.S. death rates for all cancers by race/ethnicity, 1992-2014

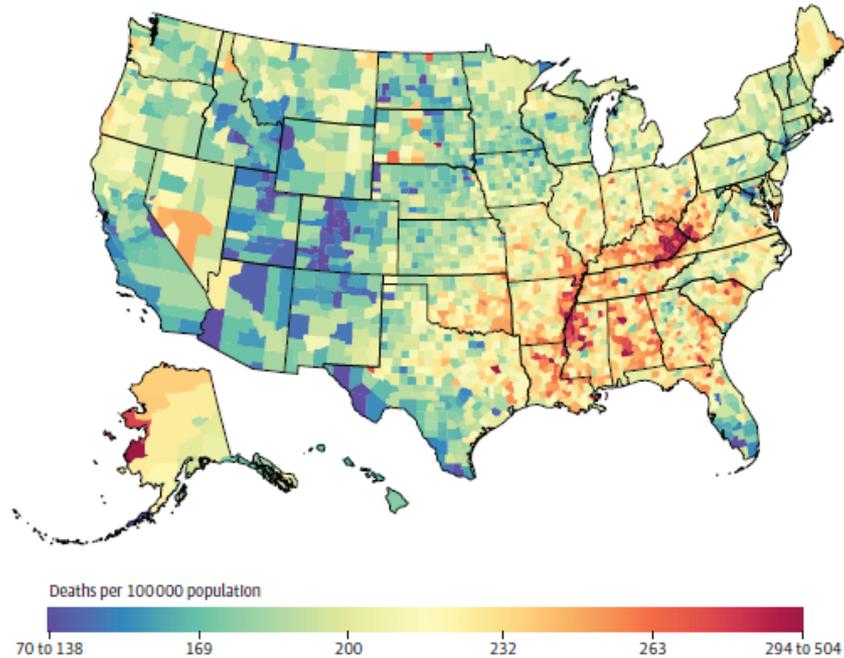


Source: National Center for Health Statistics data as analyzed by NCI.
 Data are age-adjusted to the 2000 US standard population using age groups: <1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+.

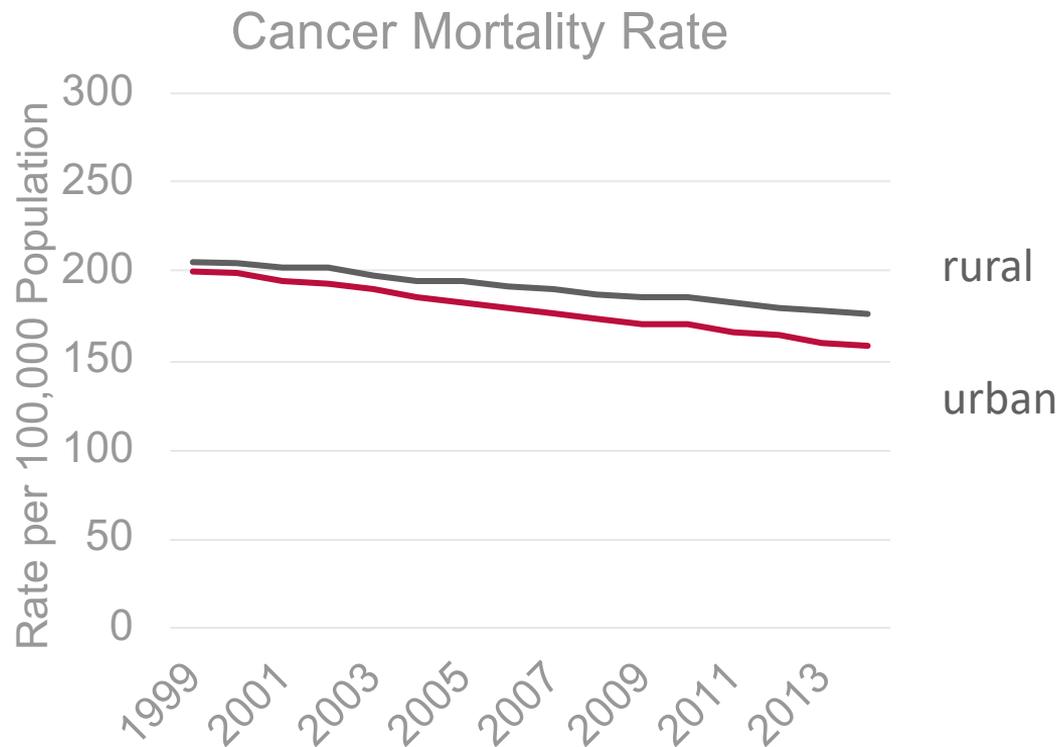
Cancer Mortality Rates

Figure 1. County-Level Mortality From Neoplasms

A Age-standardized mortality rate from neoplasms, both sexes, 2014

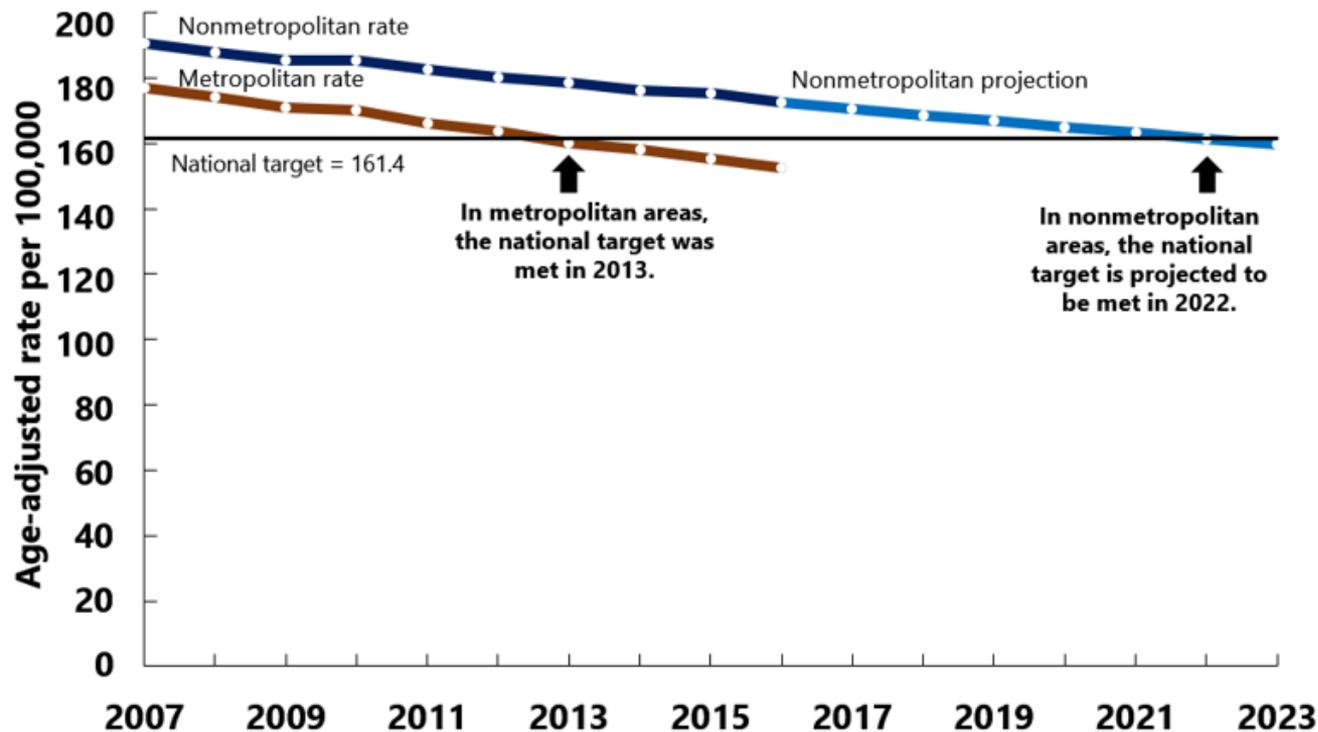


As mortality from cancer has fallen, rural-urban disparities have grown larger.



PRELIMINARY RESULTS

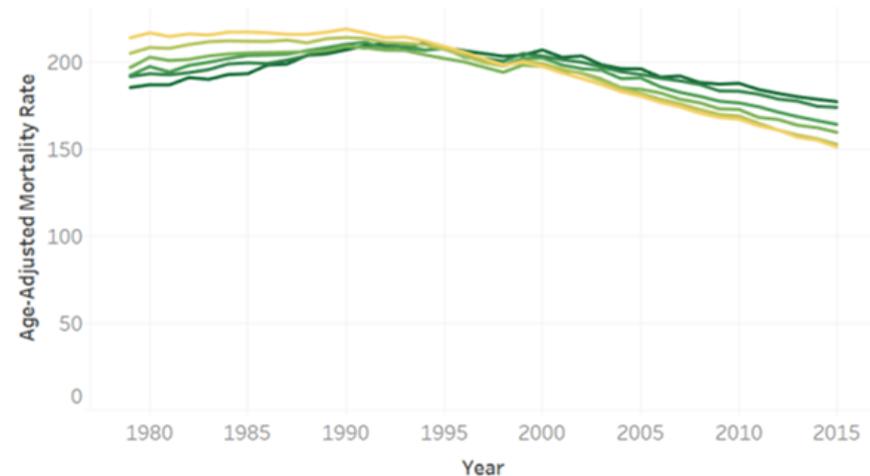
Healthy People 2020 objective C-1: Overall cancer deaths among persons of all ages — National Vital Statistics System, United States, 2007–2016



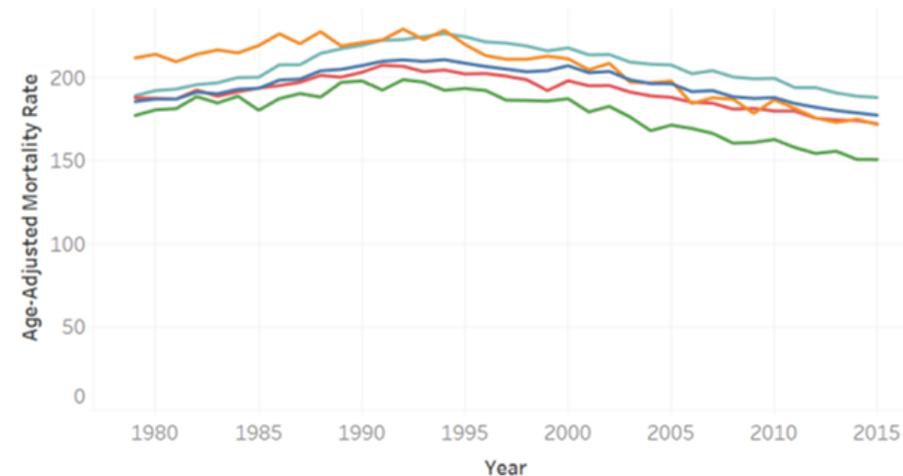
METHODS: The average annual percent change (AAPC) was calculated based on 2007–2016 mortality rates using the National Cancer Institute [Joinpoint](#) software. The nonmetropolitan trend was extended from the 2016 mortality rate until it crossed the target, assuming a constant AAPC.

Trends in Cancer Mortality by Locality and Within Rural Region (“Noncore”)

Deaths from Cancer by Locality, Total



Deaths from Cancer by Census Region, Noncore



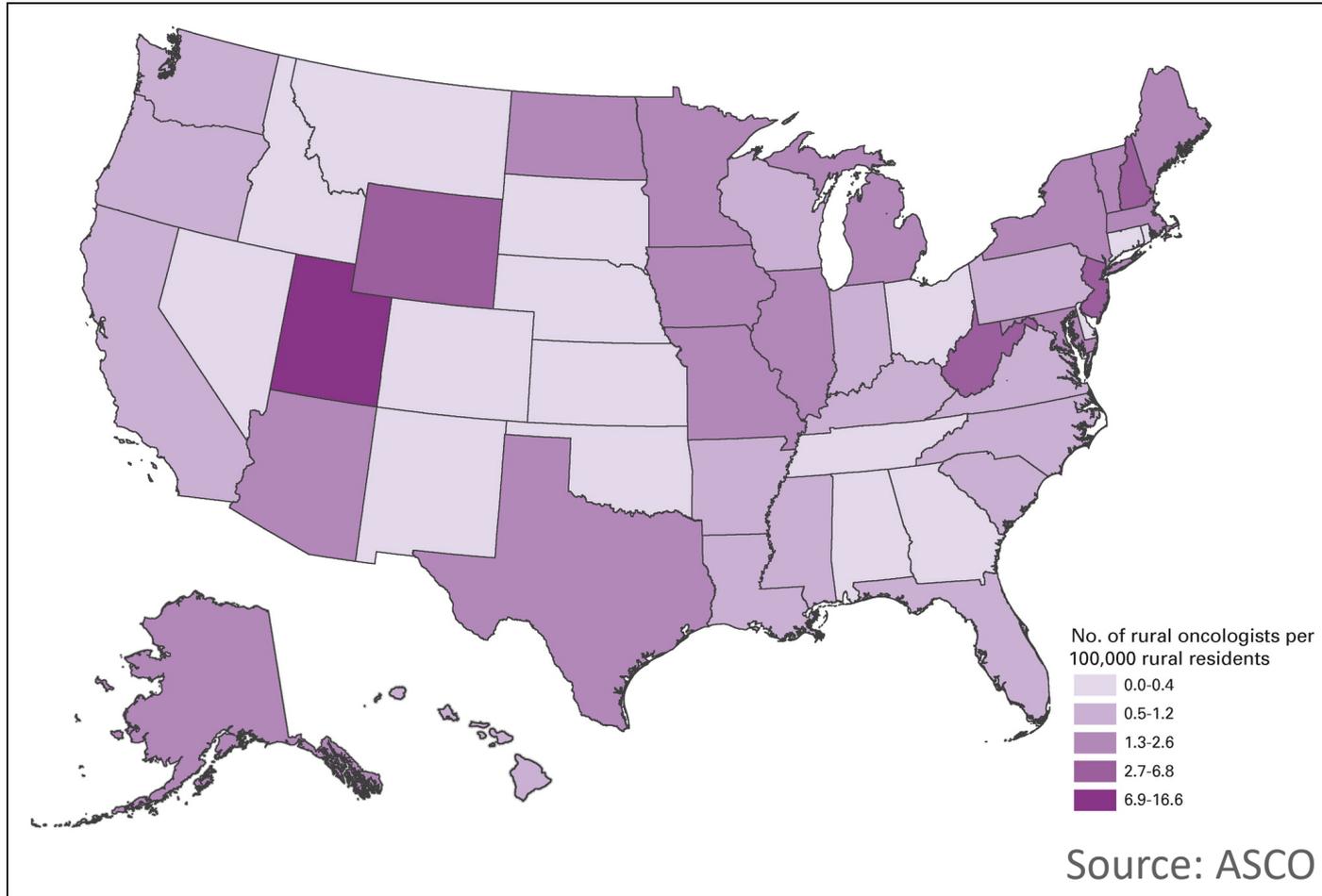
Locality

Large Ce., Large Fri., Medium., Small MSA, Micropoli., Noncore

Census Region

Total, Northeast, Midwest, South, West

Number of Rural Oncologists Per 100,000 Rural Residents



Planning and Engagement Efforts

- Development of NCI's Rural Cancer Control Research Initiative
 - Kick Off: May 18, 2016 NCI blog
 - Update: July 7, 2017 NCI blog: <https://www.cancer.gov/news-events/cancer-currents-blog/2017/rural-cancer-disparities-next-steps>
- Cancer in AI/AN Populations, Nov. 10, 2016, OKC
- Rural Cancer Control Workshop, Memphis, May 4-5, 2017
- HRSA/NCI/CDC Webinar, August 30, 2017
- FCC-NCI Collaboration on Broadband and Cancer announced, November 3, 2017
- National Academy Workshop on Small Populations Research, January 18-19, 2018
- Rural Health Policy Institute, February 6-8, 2018
- Advancing the Science of Cancer in Latinos, February 21-23, 2018
- National Rural Health Association Annual Meeting, May 8-11, 2018
- NCI Conference on Rural Cancer Control, May 30-31, 2018
- ASCO's 2nd State of Cancer Care in America event, Closing the Rural Cancer Care Gap, April 10, 2019

Scientific Challenges

Heterogeneity of “Rural”

- Example: rural Alaska vs. rural Mississippi
- “Grain size” of counties (and, therefore, data sources):
 - 3,142 total; Iowa has 99; Arizona has 15

Structural Factors that Affect both Research and Practice

- Access to care
- Limited access to clinical trials
- Lower physician density
- Distance to facilities – transportation
- Poor telecommunication infrastructure for telemedicine/telehealth
- SES and other area-level correlates and confounders

Cultural Factors

- Trust in institutions, medical providers, and government-sponsored programs
- Non-traditional comorbidities such as opiate drug use
- Cancer-related fatalism

NCI's Role as a Research Agency

- Leverage extensive research infrastructure, grant portfolio and scientific community
- Encourage more grant applications focused on rural populations
- Extend reach of clinical trials programs
- Engage NCI-funded cancer centers (n=70) in rural cancer control research (community outreach and engagement requirement)
- Support partnerships and training of new investigators

Examples of funded NCI R01 Grants

Implementing Cancer Prevention Using Patient-Provider Clinical Decision Support.

PI: Thomas Edward Elliott, Health Partners Institute

Comparative effectiveness in interventions to improve screening among rural women.

PI: Electra Paskett, Ohio State University

Enhancing prevention pathways towards tribal colorectal health.

PI: Shiraz Mishra, University of New Mexico Health Sciences Center

Community intervention to reduce tobacco use among pregnant Alaska Native women.

PI: Christi Patten, Mayo Clinic Rochester

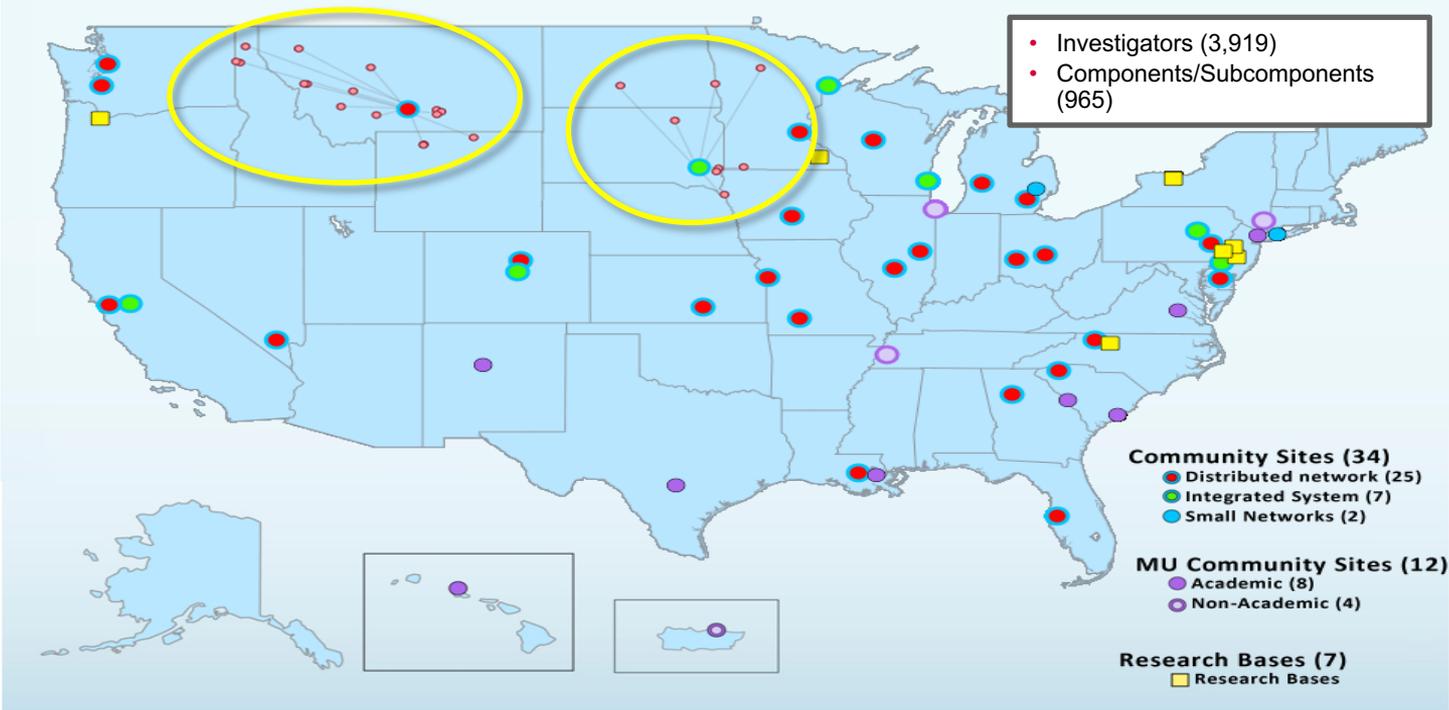
NCI Center for Reducing Cancer Health Disparities: U54 & P20 Grants with a Rural Component

Grant #	Institution	Principal Investigator (PI)
U54CA202995	Northeastern Illinois University	Christina Ciecierski
U54CA203000	Northwestern University at Chicago	Melissa Andrea Simon
U54CA202997	University of Illinois at Chicago	Robert Andrew Winn
P20CA192966/87	Washington University Southern Illinois Univ. Sch of Med	Graham Colditz Laurent Brard
P20CA202907/08	University of Illinois at Chicago Governors State University	Catherine Balthazar Robert Winn
P20CA202921/23	University of Oklahoma Norman Cherokee Nation	Paul Spicer Sohail Khan

National Community Oncology Research Program (NCORP) Overview

- A national NCI-supported network that brings cancer prevention clinical trials and cancer care delivery research (CCDR) studies to local communities
 - designs and conducts cancer prevention, control, screening, and post-treatment surveillance clinical trials;
 - designs and conducts cancer care delivery research (CCDR) studies;
 - participates in treatment and imaging clinical trials conducted by the NCI National Clinical Trials Network (NCTN); and
 - integrates health disparity questions into its research priorities.

NCORP Community Site, MU Community Site and Research Bases Geographic and Organizational Diversity



Linking and Amplifying User-Centered Networks through Connected Health (L.A.U.N.C.H.)

- NCI has partnered with the Federal Communications Commission to address the broadband health connectivity gap in rural areas of the U.S.
 - More likely to die of cancer and report lower quality treatment experiences
 - More likely to be without broadband internet
- The long-term goal of this partnership is to improve cancer outcomes by better connecting rural patients to their cancer care teams.
 - Pilot Demonstration Project: University of California at San Diego, the University of Kentucky, and the biopharmaceutical company Amgen to redesign access to care using biosensors, smartphones, patient-reported outcomes

Examples of Current Cancer Centers Initiatives

- HPV Vaccination Uptake
- Tobacco Use Assessment and Treatment Capacity
- Population Health Assessment in Cancer Center Catchment Areas
- Rural Cancer Control Research Capacity

Population Health Assessment in NCI Cancer Center Catchment Areas

- Administrative supplement program to NCI-designated (P30) Cancer Centers
- To enhance cancer centers' capacities to acquire, aggregate, and integrate population data from multiple sources in order to facilitate community-focused, comprehensive cancer control activities
- 15 awards in FY16, and 14 awards in FY18
- Includes a Rural Health Working Group

Population Health Assessment in Cancer Center Catchment Areas

Cancer Center	Project Directors	Population Health Assessment Catchment Areas	
		FY2016	FY2018
Abramson Cancer Center	Karen Glanz		
Albert Einstein Cancer Center	Bruce Rapkin	✓	
Dana-Farber/Harvard Cancer Center	K. Vish Viswanath	✓	
Duke Cancer Institute	Nadine Barrett	✓	
Fox Chase Cancer Center	Nestor Esnaola, Susan Fisher	✓	
Fred Hutchinson Cancer Research Center	Jason Mendoza	✓	
Herbert Irving Comprehensive Cancer Center of Columbia University	Mary Beth Terry		✓
Huntsman Cancer Institute	Jakob Jensen		✓
Indiana University Melvin and Bren Simon Cancer Center	David Haggstrom, Susan Rawl		✓
Masonic Cancer Center at the University of Minnesota	DeAnn Lazovich	✓	✓
Memorial Sloan Kettering Cancer Center	Joseph Osborne	✓	
Moore's Cancer Center at UC San Diego Health	Maria Elena Martinez		✓
Norris Cotton Cancer Center at Dartmouth-Hitchcock	Tracy Omega	✓	
OHSU Knight Cancer Institute	Jackie Shannon	✓	✓
Roswell Park Comprehensive Cancer Center	Elizabeth Bouchard		

Population Health Assessment in Cancer Center Catchment Areas (continued)

Cancer Center	Project Directors	Population Health Assessment Catchment Areas	
		FY2016	FY2018
Sidney Kimmel Cancer Center at Thomas Jefferson University	Grace Lu-Yao		
The Ohio State University Comprehensive Cancer Center	Electra Paskett		✓
The Tisch Cancer Institute at Mount Sinai	Nina Bickell	✓	
The University of Texas MD Anderson Cancer Center	Sanjay Shete	✓	✓
UAB Comprehensive Cancer Center	Wendy Demark-Wahnefried		✓
UCSF Helen Diller Family Comprehensive Cancer Center	Bob Hiatt, Urmimala Sarkar	✓	
UK Markey Cancer Center	Robin Vanderpool, Bin Huang	✓	
University of Colorado Cancer Center	Myles Cockburn		✓
University of Hawaii Cancer Center	Kevin Cassel, Hyeryeon Lee	✓	
The University of Kansas Cancer Center	Babalola Faseru		✓
University of Michigan Rogel Cancer Center	Ken Resnicow		✓
University of Virginia Cancer Center	Rajesh Balkrishnan, Roger Anderson	✓	✓
UPMC Hillman Cancer Center	Jian-Min Yuan		✓
Virginia Commonwealth University Massey Cancer Center	Bernard Fuemmeler		

Rural Cancer Control – Administrative Supplements to NCI Cancer Centers

*21 Funded in FY18

*Second round of funding
planned for FY19

Cancer Center	Project Director(s)	Address
Alvin J. Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine	Graham A. Colditz	660 S. Euclid Ave., St. Louis, MO 63110
Barbara Ann Karmanos Cancer Institute at Wayne State University	Lauren M. Hamel, Hayley S. Thompson	4100 John R, Detroit, MI 48201
Holden Comprehensive Cancer Center at The University of Iowa	Mary Charlton	200 Hawkins Drive, Iowa City, Iowa 52242
Huntsman Cancer Institute	Deanna Kepka, Mia Hashibe	2000 Circle of Hope, Salt Lake City, UT 84103
Mayo Clinic Cancer Center	Carmen Radecki Breitkopf	200 First St. SW, Rochester, MN 55905
Norris Cotton Cancer Center at Dartmouth-Hitchcock	Tracy Onega	One Medical Center Drive, Lebanon, NH 03756
Roswell Park Comprehensive Cancer Center	Elizabeth Gage Bouchard	Elm & Carlton Streets, Buffalo, NY 14263
Stephenson Cancer Center at The University of Oklahoma	Mark Doescher	800 NE 10th St., Oklahoma City, OK 73104
The Ohio State University Comprehensive Cancer Center	Electra Paskett	650 Ackerman Road, Columbus, OH 43202
UAB Comprehensive Cancer Center	Isabel C. Scarinci	1824 Sixth Ave. South, Birmingham, AL 35294
UC Davis Comprehensive Cancer Center	Moon Chen	4501 X St., Sacramento, CA 95817
UK Markey Cancer Center	Robin Vanderpool, Kim Carter	800 Rose St., Lexington, KY 40536
UNC Lineberger Comprehensive Cancer Center	Daniel Reuland	450 West Drive, Chapel Hill, NC 27599
University of Arizona Cancer Center	Beth Calhoun	1515 N. Campbell Ave., Tucson, AZ 85724
University of Kansas Cancer Center	Christie Befort, Allen Greiner	3901 Rainbow Blvd., Kansas City, KS 66160
University of Michigan Rogel Cancer Center	Sarah Hawley	1500 E. Medical Center Drive, Ann Arbor, MI 48109
University of New Mexico Comprehensive Cancer Center	Andrew Sussman	1201 Camino de Salud NE, Albuquerque, NM 87131
University of Virginia Cancer Center	Jamie Zoellner	6171 West Complex, Charlottesville, VA 22908
University of Wisconsin Carbone Cancer Center	Tracy Downs	1111 Highland Ave., Madison, WI 53705
Vanderbilt-Ingram Cancer Center	Debra Freeman	691 Preston Research Building, Nashville, TN 37232
Wake Forest Baptist Medical Center Comprehensive Cancer Center	Karen Winkfield, Kathryn Weaver	1 Medical Center Blvd., Winston-Salem, NC 27157

Improving the Reach and Quality of Cancer Care in Rural Populations (R01 Clinical Trial Required)

RFA-CA-18-026

- To support observational/analytic research and pilot testing of interventions to identify, understand, and address predictors of low quality of cancer care in rural low-income and/or underserved populations
- To support cancer control intervention research to address known predictors of low quality of care (e.g., low reach due to distance) in rural low-income and/or underserved populations
- All studies will be required to employ the USDA's Rural Urban Continuum Code (RUCC) to define nonmetropolitan geographic target areas of study
- To be awarded in FY19 (summer 2019)

DCCPS Cancer Moonshot Initiatives – with a focus on rural health



- Accelerating Colorectal Cancer Screening and follow-up through Implementation Science (ACCSIS) –
 - to generate effective implementation strategies that substantially improve CRC screening and follow-up rates in populations where baseline rates remain low
 - Funded 3 research grants and 1 coordinating center in FY18 (see next slide for details)
 - Plans to fund more research centers in FY19.

- Improving CRC Screening for American Indian populations –
 - FY18 funding to allow three cancer centers to build partnerships, procure tribal support; get tribal and Indian Health Service IRB approvals; and pilot test CRC implementation processes in each state
 - Funding planned for FY19 and 3 additional years.
 - University of New Mexico Cancer Center, University of Arizona Cancer Center, Stephenson Cancer Center at University of Oklahoma

ACCSIS Projects

- ***ACCSIS-Chicago (1 UG3 CA233220); Karen Kim, Blase Polite, U Chicago***

Investigators propose to study the effectiveness of a multilevel intervention to improve CRC incidence and mortality **among at-risk populations in safety-net clinics** in Cook County, Chicago, Illinois. Multi-level intervention includes provider education; community outreach; provider reminder, assessment, & feedback system; patient navigation.

- ***ACCSIS in Appalachia (1 UG3 CA233282); Mark Dignan, U Ky; Electra Paskett, OSU***

Investigators propose to examine the impact of a multilevel intervention on improving CRC outcomes among **Appalachian populations** in Kentucky and Ohio. The intervention will consist of academic detailing, patient activation to include distribution of fecal immunochemical tests kits, and social support via a patient navigator.

- ***Scaling Colorectal Cancer Screening Through Outreach, Referral, and Engagement (SCORE): A State-Level Program to Reduce Colorectal Cancer Burden in Vulnerable Populations (1 UG3 CA233251); Daniel Reuland, UNC-Chapel Hill***

Investigators propose to assess the effectiveness of a multilevel intervention to improve CRC outcomes among **low-income and racial and ethnic minority populations in North Carolina**. The intervention will consist of a centralized colorectal cancer screening registry, distribution of fecal immunochemical test kits, patient navigation, an in-clinic patient decision aid, and establishing a colonoscopy access network.

Online Summary of Trends in US Cancer Control Measures

Prevention ▾ Early Detection ▾ Diagnosis ▾ Treatment ▾ Life After Cancer ▾ End of Life ▾ Summary Tables



The Cancer Trends Progress Report, continually updated since its first issue in 2001, summarizes our nation's advances against cancer in relation to **Healthy People** targets set forth by the Department of Health and Human Services. The report, intended for policy makers, researchers, and public health professionals, includes key measures of progress along the cancer control continuum and uses national trend data to illustrate where improvements have been made.

Read our **Introduction** and **Director's Message** to learn more about the report.

- About the Report ▶
- Data Sources
- Highlights
- Trends at a Glance
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Prevention

Tobacco, physical activity, diet, sun, environment, HPV immunization



Early Detection

Breast, cervical, colorectal, lung, prostate cancer screening



Diagnosis

Incidence, Stage at diagnosis



Treatment

Trends in cancer treatment



Life After Cancer

Financial burden of cancer care, Cancer survivorship



End of Life

Mortality, Person-years of life lost

The report, available only online, can be printed in part or in its entirety. Portions of the report are updated annually, while other sections are updated as new data become available. The full report is updated every year.

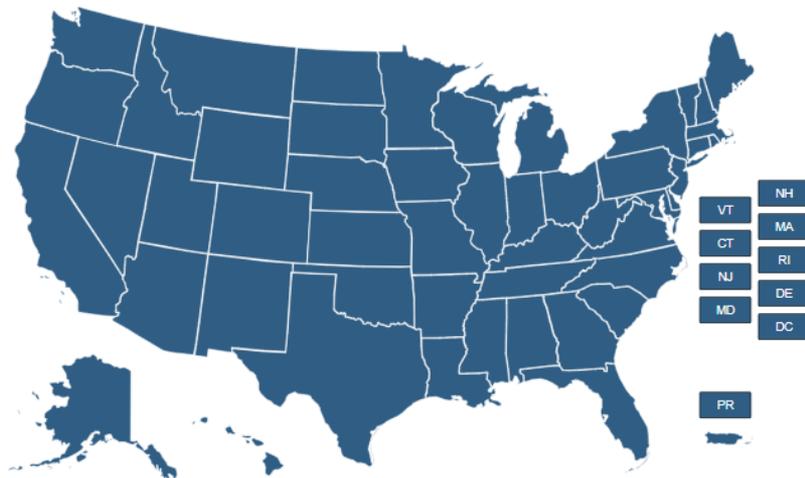
Suggested Citation:

Cancer Trends Progress Report
National Cancer Institute, NIH, DHHS, Bethesda, MD, February 2018, <https://progressreport.cancer.gov>.

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Quick Profiles for States

Choose a state below to get a report of cancer statistics and other related topics.



--- Choose a State ---

[View Quick Profile >](#)

Data Topics Across the Cancer Control Continuum

Cancer statistics, charts, and maps by data topic across the cancer control continuum.



Demographics



Screening & Risk Factors



Cancer Knowledge



Incidence

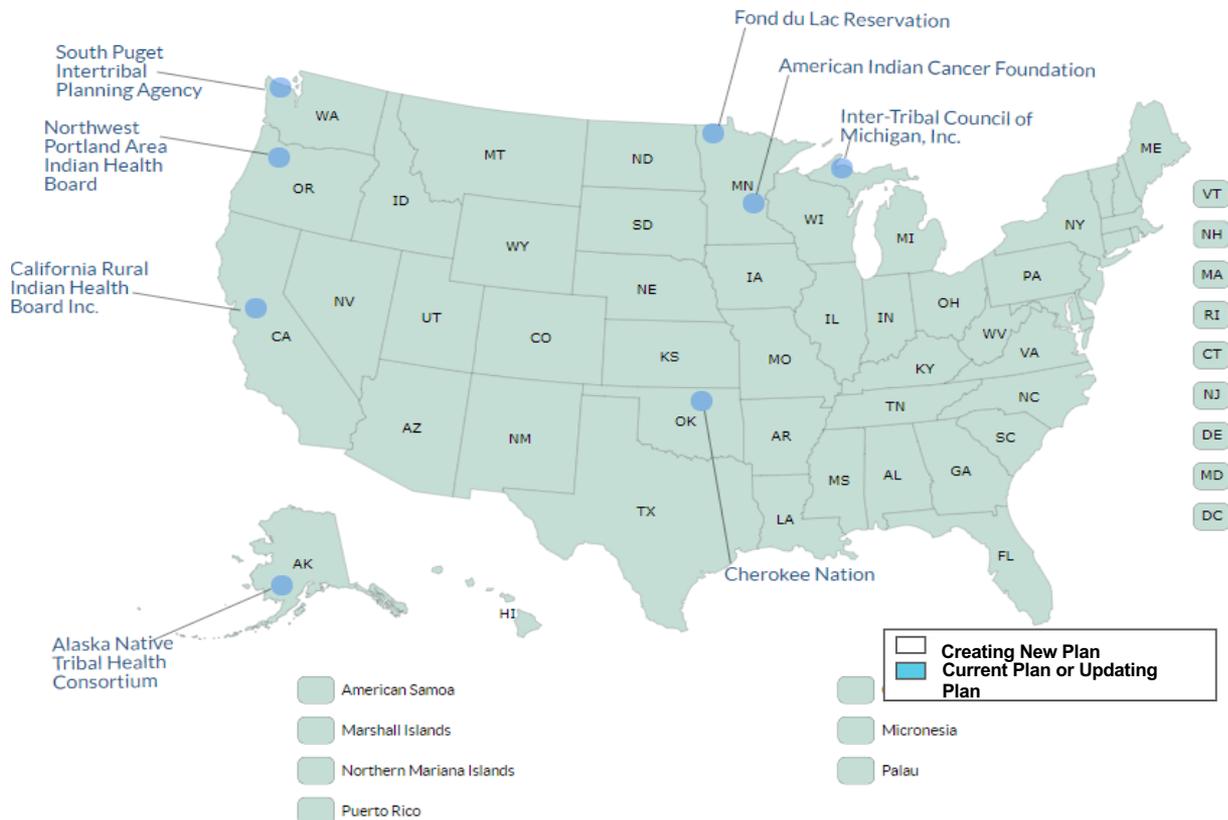


Prevalence



Mortality

2018 National Comprehensive Cancer Control Status of Cancer Plans



Comprehensive Cancer Control National Partnership: Opportunities for Rural Cancer Control

- State cancer plans provide
 - Description of current needs
 - Overview of current cancer control goals and strategies
- 56 of 66 funded programs include some reference to “rural/frontier” in their plans.
- Potential for linking research with state cancer control practice to address rural issues

Improving Cancer-Related Outcomes with **CONNECTED HEALTH**



A Report to the President of the United States
from the President's Cancer Panel



Connected Health: Improving Patients' Engagement and Activation for Cancer-Related Health Outcomes

President's Cancer Panel
2014-2015 Series

The power and utility of connected health technologies are growing. Many forces are catalyzing a national U.S. effort to engage and activate individuals to be more proactive about their health and healthcare and to translate this engagement to enhanced activation among patients. These forces have important implications for the prevention and treatment of cancer and for optimal survivorship. They include but are not limited to:

- **“Meaningful Use”** incentives to healthcare providers focus on requirements to demonstrate “patient engagement” through health information technology (Phases 2 & 3).
- **The “Quantified Self”** movement is creating new tools to encourage and reinforce a variety of healthy behaviors relevant to cancer control.
- **The Internet** has made vast amounts of health information available, and social media platforms have

A patient with a complex chronic condition receives a prescription for an app that is downloaded to a mobile device. Using information the patient enters, the app delivers automated clinical coaching and sends reports to the physician, recommending evidence-based protocols for adjusting the patient's treatment regimen, if needed. Equipped with a tool that offers personal, relevant

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University of California, Los Angeles
Los Angeles, CA

Challenges and Future Steps

- Worsening urban/rural health disparity
- Limited NCI research grant portfolio that we plan to grow
- Need to inform cancer control researchers about rural health policy issues
- Requires new collaborations between rural health and cancer control experts
- Facilitate interdisciplinary and cross-sector collaboration
- Leverage national cancer research infrastructure to improve cancer prevention, detection and care to reduce cancer burden in rural communities